

R E M A R K S

Claims 1, 6 and 25 have been amended to overcome the rejection of claims 6, 7 and 25 under 35 U.S.C. §112, second paragraph, as indefinite. In addition, claim 25 has been rewritten in independent form to incorporate all the recitals of claim 1, on which it was heretofore dependent. Since this Amendment does not increase either the total number of claims or the number of independent claims (beyond that previously paid for), no additional fee is necessary.

Claims 1 - 7 and 25 are in the application. No claim has been allowed.

The §112 Rejection

In response to the rejection of claims 6, 7 and 25 under §112, second paragraph, as indefinite for lack of an antecedent for "the toner" in claims 6 and 25, claim 7 being dependent on claim 6 (Office Action, numbered paragraph 13), claim 1 has been amended to recite that the color toner images "are respectively formed by yellow, magenta and cyan color toners." This recital is supported by the disclosure of the original specification, e.g. at p. 6, lines 4-22. The same recital has been included in rewritten claim 25, and a clarifying change in wording has been made in claim 6, which is dependent on claim 1. It is believed that these amendments fully and self-evidently overcome the §112 rejection as to all claims against which it was asserted.

The Double Patenting Rejection

The provisional obviousness-type double patenting rejection (Office Action, numbered paragraph 15) is noted. Since no patent has yet issued on application No. 10/302,898, it is believed unnecessary to respond to the rejection at this time.

Claim 25

Claim 25 has been rejected only under §112 and on the provisional obviousness-type double patenting ground. Although the claim was heretofore dependent on claim 1, which stands rejected under 35 U.S.C. §103(a), it has now been rewritten in independent form to incorporate all the limitations of claim 1 and to overcome the §112 rejection as explained above. Therefore, it is submitted that rewritten claim 25 is allowable, subject only to resolution of the provisional obviousness-type double patenting issue.

The §103 Rejection

With reference to the rejection of claims 1 - 7 under §103(a) as unpatentable over various combinations of references, it may initially be noted that the claimed invention is directed to an improvement in methods that use non-contact fixing for forming a full color image.

The Examiner has cited and applied references (Elsermans et al., McNally and Moser) disclosing that contact fixing methods have been known to present problems such as image offsetting, resolution degradation, etc.) and/or describing non-contact fixing methods. On the other hand, as applicants' specification sets forth (at p. 2, lines 18-23), non-contact fixing methods are themselves associated with problems in image quality including difficulty in achieving good color reproducibility and poor light resistance. The objective of the present invention is to enable the attainment, with non-contact fixing methods, of image quality as good as that provided by contact fixing methods, so that inferior image quality does not detract from the benefits of non-contact fixing.

Thus, the invention aims at providing image quality, in non-contact fixing operations, that is equal (not superior) to that

afforded by contact fixing procedures (such as, for instance, that of Iwasaki et al.). The attainment of image quality, with non-contact fixing, equivalent to that of contact fixing, is itself a beneficial new result because it overcomes a drawback of the otherwise advantageous non-contact fixing methods.

None of the references cited by the Examiner as showing non-contact fixing or its advantages even alludes to the aforementioned problems of inferior image quality heretofore associated therewith - let alone suggests how to overcome those problems.

The outstanding grounds of rejection of claims 1 - 7 under §103(a) are as follows:

- (1) Elsermans combined with Iwasaki¹ and further combined with Kuramoto '478 in the rejection of claims 4 and 5;
- (2) Iwasaki combined with McInally and Moser, with which Kuramoto '478 is further combined against claims 4 and 5;
- (3) Aoki combined with Moser and Iwasaki, with which Kuramoto '478 is further combined against claims 4 and 5;
- (4) Takahashi combined with Moser and Iwasaki, with which Kuramoto '478 is further combined against claims 4 and 5; and
- (5) Hata combined with Moser and Iwasaki, with which Kuramoto '478 is further combined against claims 4 and 5.

The last three grounds of rejection are characterized as cumulative in numbered paragraph 13 on p. 18 of the aforesaid Office Action.

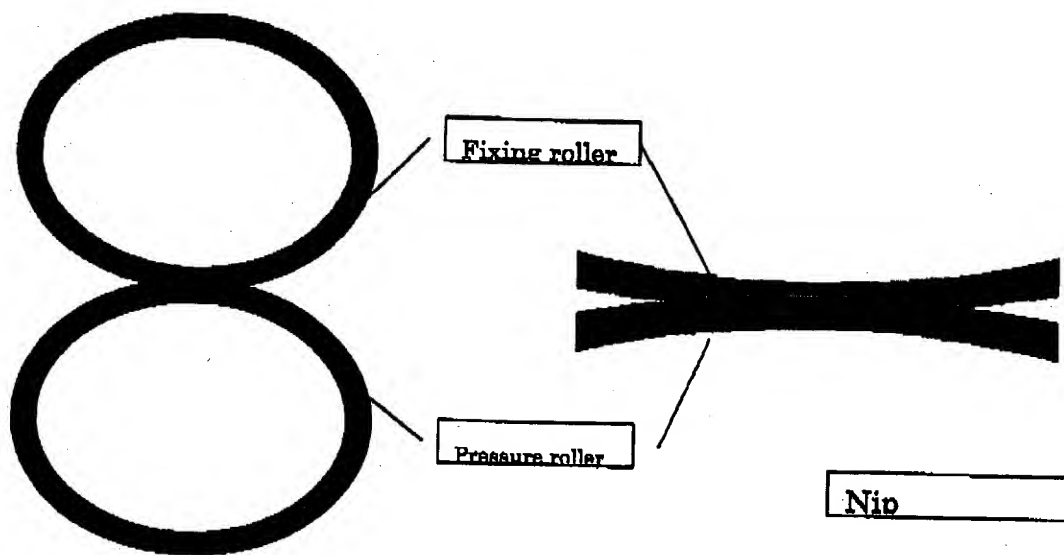
In response to these five grounds of rejection, applicants again submit that claim 1, and claims 2 - 7, dependent on claim 1, distinguish patentably over the applied references, however combined, essentially for the reasons set forth in their First

¹In applying Iwasaki, the Office Action refers to certain Chemical Abstract registry numbers and another publication as establishing that the yellow, magenta and cyan toners identified by Iwasaki meet the recitals of applicants' claim 1. For brevity, these additional citations are not mentioned in the following discussion, but it is to be understood that reference herein to "Iwasaki" means Iwasaki as evidenced by the additional citations.

Reply to Final Rejection mailed March 27, 2003, and in the Remarks of their Amendment filed October 30, 2003, both of which are incorporated herein by this reference.

Additionally, it may be explained that a roller fixing device typically has a constitution such that a fixing roller having a release layer thereon is located on a pressure roller (see the figure below).

A full color image typically has a large image area proportion and includes plural color toner images. Namely, a full color image bears a large amount of toners thereon. In addition, the binder resins constituting the color toners typically have a low softening point. Therefore, a problem in that a receiving sheet bearing color toner images thereon winds around the fixing roller occurs. In order to avoid this paper-winding problem, color image fixing devices typically have a constitution such that the surface of the fixing roller is recessed at the nip as illustrated in the figure below.



Since color image fixing devices have such a constitution, it is impossible for the fixing devices to fix both images of a double sided color copy at the same time. Even if a pressure roller having a release layer thereon is used for the roller fixing devices, the paper-winding problem tends to occur (a paper winds around the pressure roller) because the nip portion has such a form. As long as the fixing devices have a constitution such that the upper or lower roller is recessed at the nip therebetween, it is impossible to fix both images of a double-sided color copy at the same time.

Regarding the asserted obviousness of the claimed invention from the prior art, applicants submit that the present application relates to non-contact fixing methods. Non-contacting fixing devices do not cause the paper winding problem. Therefore, it becomes possible to output double sided copies at a high speed. By using the technique of the present invention, double sided copies can be produced at a high speed and therefore this technique can also be used for printing fields.

However, as described in the present application, when a conventional toner is used for non-contacting fixing methods, images having good color reproducibility (i.e., well-balanced color tones) cannot be produced. Particularly, it is difficult to reproduce color images having a good combination of red color reproducibility and blue color reproducibility. (When layered color toner images are fixed with a non-contact fixing device, the interface therebetween is not smooth, resulting in occurrence of irregular reflection at the interface and thereby a mixed color image having good color tone cannot be produced. In contrast, layered color toner images fixed with a roller fixing device have smooth interface and therefore the images have good color reproducibility.)

The present invention solves this color balance problem in non-contact fixing by properly combining colorants in the color toners, as well as the order of their positioning, as recited in claim 1. This technique is not disclosed nor suggested in the prior art. Therefore, applicants submit that the present invention is not obvious from the applied references and any proper combinations thereof.

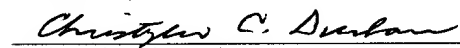
For the foregoing reasons, it is believed that this application is now in condition for allowance. Favorable action thereon is accordingly courteously requested.

Respectfully,



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I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.


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Reg. No. 22,031 Date JULY 6, 2004